

layer between the substrate surface and the metathesis polymer. See Col. 2, line 59-62.

The examples of Giardello patent are briefly summarized.

Example 1 represents the synthesis of a chlorosilane- adduct of 5-norbornene-2-methanol .

Example 2 is entitled "Adhesion of Poly-DCPD to Octyltriethoxysilane (OTES)." This is a comparative example to show poor adhesion to Glass surfaces pretreated with an alkyl silane of the prior art. Octyltriethoxysilane is used to pre-treat glass. The glass is contacted with an "activated" DCPD Polymer which has formulated in it, Ethanox®, and metathesis catalyst. The resin is poured onto the glass. The hardened resin adheres poorly.

Example 3 repeats the method of example 2, using allyltriethoxysilane (ATES). Adhesion is improved, presumably because of cross-metathesis reactions at the glass-polymer interface between the allylsilane and the polymer.

Example 4 pre-applied the chlorosilane-norbornene of Example 1 to glass. The glass was placed in a RIM mold and the mold was filled with a poly-DCPD resin which was previously prepared by reacting DCPD monomer with ruthenium catalyst, and cured at 40° C for 30 minutes. (Col. 10, line 8-15)

Example 5 involves gold metal plated glass. A carboxy-modified norbornene is coated on the glass, and then the glass is dipped in a poly-DCPD resin. The slide is cured, and the polymer adheres until scraped off.

Example 6 is a coating formed by dipping glass into a thickening poly-DCPD resin. After curing the resin has shrunk away from the bottle.

Example 7 repeats example 6 except the bottle is pre-treated with norbornene coupling agent. The polymer firmly adheres.

Example 8 illustrates that the allyltriethoxysilane (ATES) when mixed into the resin retards the polymerization resulting in a tacky, soft polymer with unpolymerized DCPD.

Examples 9 and 10 illustrate treating a 20-layer glass fabric with poly-DCPD resin with and without a pretreatment using allyltriethoxysilane pre-treatment.

Example 11 involves pretreating a pre-preg of poly-DCPD and fabric with a solution of ATES in toluene.

The entire teaching of Giardello pertains to using tie-layers which will cross-metathesize to a polymer. The bond line between the substrates such as glass, and poly-DCPD in all cases is a tie-layer of functionalized adhesion agent that cross-bonds to a DCPD resin. The claims of Giardello are also limited to a method for adhering a polyolefin resin to a substrate using a compound that contains an active double bond and compatibilizing functionality, and applying the polyolefin resin in the presence of a metal carbene catalyst.

The Patent Office has characterized Giardello as “glueing” a ROMP polyolefin to a substrate. However that is not what is claimed in claim 30. Claim 30 adheres or “glues” at least two substrates together by placing a mixture of “highly reactive cycloolefin monomer” and metathesis catalyst on one substrate, followed by adhering the substrates. Whereas, Giardello preapplies a cross-metathesizing adhesion agent to a substrate or pre-preg and then applies a ROMP polymer. The ROMP polymer does not form the adhesive because it was shown to have poor adhesion by itself. The elements of claim 30 which are not met by Giardello are:

(1) a second substrate other than the ROMP polymer is not present. This is so because claim 30 recites three elements, two substrates and adhesive which is a mixture of highly reactive cycloolefin and catalyst. The adhesive forms a polymer from this mixture, and the mixture does not have a separate tie layer. Giardello recites a non-highly reactive cycloolefin tie layer, one substrate and a ROMP polymer applied to the substrate. The tie layer is a functionalized compound that cross-metathesizes to the ROMP polymer. It should be recognized that the adhesive of claim 30 does not cross-metathesize to a polymer, except where a polymer is mixed into the adhesive. Giardello does not mix a polymer with an adhesive.

(2) there is no mixture of a highly-reactive cycloolefin with a catalyst that exists as the bonding material between two substrates in Giardello. Claim 30 and dependent claims are therefore believed to be novel, and the rejection under 35 U.S.C falls.

Another way of appreciating the above distinction is to see that in Applicants' method, the adhesive which comprises the polymerizate from the intermixture of highly reactive cycloolefin and catalyst adhesively bonds to two substrates on both sides of the bonding layer, whereas the Giardello method results in a metathesis resin which is cured only to the tie layer. There is no other substrate bonded to the metathesis polymer on the surface opposite the tie layer.

Respectfully submitted,

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